

Trends in Discharge and Length of Stay Of Patients in a Tuberculosis Hospital

By ABRAHAM GELPERIN, M.D., Dr.P.H., LEON J. GALINSKY, M.D.,
ROBERT J. ANDERSON, M.D., and ALBERT P. ISKRANT, M.A.

Since the advent of streptomycin, PAS, and isoniazid for tuberculosis, relatively little formal information has been published on the effects of chemotherapy on such matters as duration of hospital stay, discharges against medical advice, and other factors bearing on tuberculosis control. Little has been said, too, about the psychological impact of the effectiveness of this type of therapy on patient behavior and willingness to endure prolonged treatment.

Although the accompanying paper relates to the experience of a single institution with an admittedly small total population, it represents a beginning in the accumulation of formal knowledge growing out of the use of effective chemotherapy in tuberculosis. The observations are merely indicative, and not of general applicability, and it is hoped that their presentation will stimulate further study and reporting on this vital subject.

RECENTLY there has been much discussion regarding the effect of present treatment methods on the welfare of the tuberculosis patient, on his stay in the hospital, and on the degree to which home care is supplanting hospitalization and affecting future demands for hospital beds. To answer these questions ideally would involve lifelong followup of patients through their various admissions and

readmissions to sanatoriums to determine the effect of modern therapy on hospitalization procedures and practices. Such studies should be done, but they involve long-term followup, not only in the immediate community served by the sanatorium but also in the areas to which patients have moved. Such a study was not attempted here. This study was made at Broadlawns sanatorium (Broadlawns Polk County Hospital, Des Moines, Iowa) to find out what has happened to patients discharged from hospital care. The study covers the single hospitalization period from the time these patients were admitted or readmitted with active pulmonary tuberculosis to the time they were discharged.

Ideally, this study would take the admissions in the various years and determine the length of hospitalization of each admission. This, however, cannot be done for the later years, as many of the admissions are still in the sanatorium. Instead, the discharges for each of the

Dr. Gelperin is director of the Des Moines and the Polk County Health Departments, and Dr. Galinsky is director of the tuberculosis division of the Broadlawns Polk County Hospital, Des Moines, Iowa. Dr. Anderson is assistant chief of the Division of Special Health Services, Public Health Service, and Mr. Iskrant is chief of the Program Analysis Section, Chronic Disease and Tuberculosis Program of the division.

years, from January 1, 1946, through October 31, 1953, were analyzed. This study started with 1946 because this was the year before the introduction of streptomycin as treatment in this sanatorium. PAS (para-aminosalicylic acid) was introduced in 1948 and isoniazid in 1952.

Patients' status for each year from 1946 through October 31, 1953, for all discharges except transfers is shown in table 1 and figure 1. Patients admitted with minimal active tuberculosis are not shown separately because of their small number, but they are included in the total. In the following analysis we have described separately—because of different patterns—the status of discharged patients who had moderately advanced or far advanced tuberculosis on admission to the sanatorium.

Status on Discharge

For patients with moderately advanced tuberculosis, the trend in discharges appears to be toward a larger proportion leaving with medical advice and fewer leaving against medical

advice. The proportion of patients dying has remained relatively constant. This is shown in table 1 and figure 1.

A definite trend toward "discharged with advice" and away from "discharged against advice" and "dead" is apparent for patients with far advanced tuberculosis. However, the most pronounced finding for all cases of tuberculosis is the decrease in the numbers and proportions of persons discharged against medical advice.

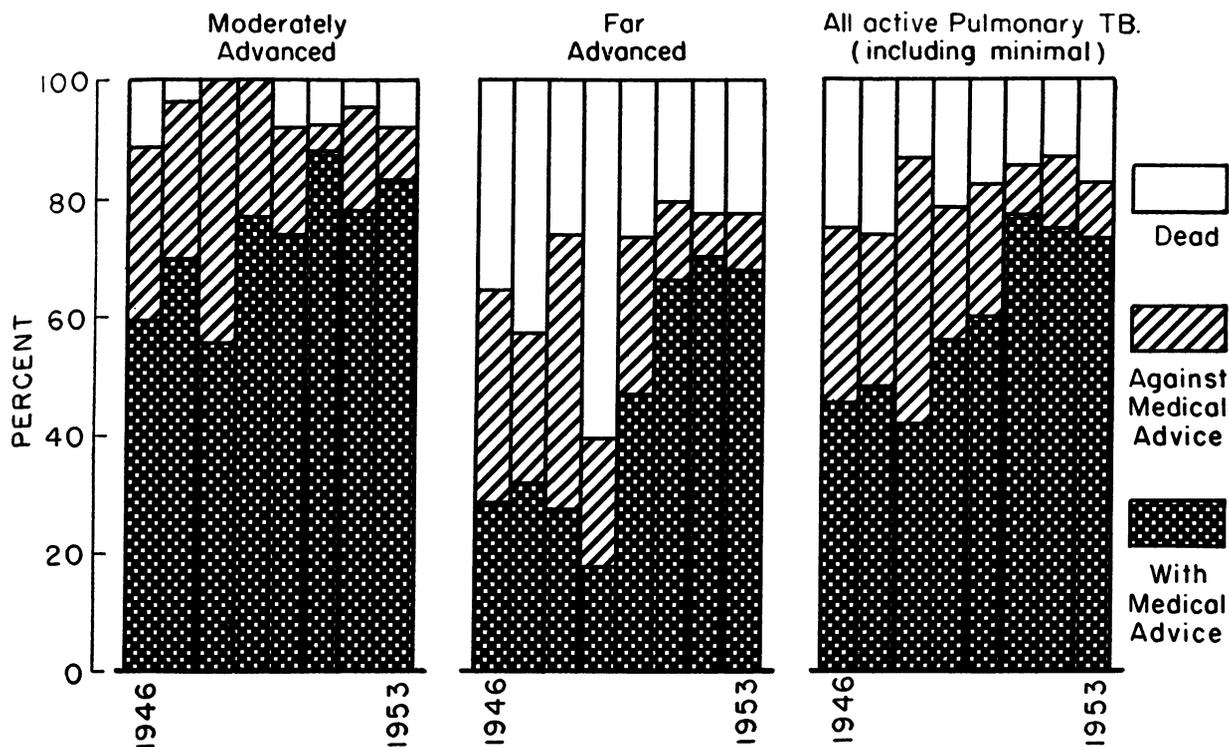
Length of Hospitalization

The duration of hospital stay of patients with moderately advanced tuberculosis discharged with medical advice appears to be decreasing from a peak of 820 days in 1949 to an average of 261 days in 1953 (table 2, fig. 2). There is no obvious trend in the average stay of those discharged against advice but the numbers for any year are small. The small number of deaths in this stage makes impossible any analysis of duration of stay for that category. In general, for cases admitted with moderately advanced tuberculosis, the duration of hospital stay ap-

Table 1. Discharges, excluding transfers, for tuberculosis patients with and against advice, and deaths, at the Broadlawns sanatorium, 1946 to Oct. 31, 1953

Stage on admission	Year of discharge	Total	Type of discharge					
			With advice		Against advice		Dead	
			Number	Percent	Number	Percent	Number	Percent
Moderately advanced.....	1946	17	10	58.8	5	29.4	2	11.8
	1947	30	21	70.0	8	26.7	1	3.3
	1948	27	15	55.6	12	44.4	0	0
	1949	30	23	76.7	7	23.3	0	0
	1950	23	17	73.9	4	17.4	2	8.7
	1951	24	21	87.5	1	4.2	2	8.3
	1952	23	18	78.3	4	17.4	1	4.3
	1953	24	20	83.3	2	8.3	2	8.3
Far advanced.....	1946	25	7	28.0	9	36.0	9	36.0
	1947	44	14	31.8	11	25.0	19	43.2
	1948	26	7	26.9	12	46.2	7	26.9
	1949	18	3	16.6	4	22.2	11	61.1
	1950	26	12	46.2	7	26.9	7	26.9
	1951	24	16	66.7	3	12.5	5	20.8
	1952	27	19	70.4	2	7.4	6	22.2
	1953	32	22	68.8	3	9.4	7	21.9
All active pulmonary tuberculosis (including minimal).	1946	47	21	44.6	14	29.8	12	25.5
	1947	77	37	48.0	20	26.0	20	26.0
	1948	53	22	41.5	24	45.3	7	13.2
	1949	50	28	56.0	11	22.0	11	22.0
	1950	51	31	60.8	11	21.5	9	17.6
	1951	49	38	77.5	4	8.2	7	14.3
	1952	52	39	75.0	6	11.5	7	13.5
	1953	58	43	74.1	5	8.6	10	17.2

Figure 1. Tuberculosis patients discharged from Broadlawns sanatorium, 1946-53, by type of discharge and stage of disease on admission.



pears to have increased from 1946 to 1949, in which year the average hospital stay was 682 days per case discharged. A gradual decline from 1949 to 1953 is apparent with the average duration of discharges decreasing to 249 days in 1953.

The duration of hospital stay for those patients with far advanced tuberculosis discharged with medical advice appeared to increase through 1949 and has remained rather high since. The hospital stay of far advanced cases dying from tuberculosis appear to have increased somewhat since 1946. In general it might be said that for far advanced tuberculosis, the hospital stay increased from 1946 to 1949 and possibly has leveled off since that year.

The duration of hospital stay for all pulmonary tuberculosis patients discharged with medical advice seemed to increase through 1949 and then level off. The duration of stay of all patients who died from pulmonary tuberculosis seems to have increased with the highest average number of days in 1951. In general, the duration of hospitalization increased by 1949 to a peak of 686 days per patient discharged.

The average in 1953 was 533 days, which was much less than the peak in 1949 but still much greater than the 1946, 1947, and 1948 peaks.

Trend to Home Care

In 1951, 13 tuberculous patients previously discharged were found in need of care and were placed in a home care program. Subsequently, 66 additional patients have been discharged from Broadlawns to be treated at home under the direction of the hospital as follows: 14 in 1951, 27 in 1952, and 25 in the first 10 months of 1953. Three of these 66 patients received no hospitalization other than for diagnostic study.

Of 79 cases placed on home care to date (15 cases prior to July 1951), only 4 were classified as minimal in extent on discharge with 44 moderately advanced and 31 far advanced. Five cases were classified as active or questionably active on discharge and the remainder as arrested or apparently arrested.

A rather pronounced decline in the duration of hospitalization of those persons discharged to home care has occurred (fig. 3). Following

Table 2. Discharge status and duration of hospital stay in days for tuberculosis patients at Broadlawns sanatorium, 1946 to Oct. 31, 1953

Stage on admission	Year of discharge	With advice		Against advice		Dead		Total	
		Number of patients	Average stay						
Moderately advanced.....	1946	10	516	5	110	2	233	17	363
	1947	21	307	8	74	1	54	30	237
	1948	15	299	12	216	0	-----	27	262
	1949	23	820	7	228	0	-----	30	682
	1950	17	496	4	195	2	821	23	472
	1951	21	390	1	481	2	984	24	444
	1952	18	495	4	224	1	73	23	429
	1953	20	261	2	299	2	72	24	249
Far advanced.....	1946	7	308	9	92	9	470	25	289
	1947	14	319	11	151	19	284	44	262
	1948	7	474	12	246	7	493	26	374
	1949	3	865	4	477	11	772	18	722
	1950	12	713	7	345	7	352	26	517
	1951	16	665	3	573	5	1, 153	24	755
	1952	19	847	2	115	6	740	27	769
	1953	22	844	3	229	7	787	32	774
All active pulmonary tuberculosis (including minimal).	1946	21	383	14	99	12	396	47	301
	1947	37	304	20	117	20	272	77	248
	1948	22	355	24	231	7	493	53	317
	1949	28	797	11	318	11	772	50	686
	1950	31	558	11	291	9	456	51	482
	1951	38	552	4	550	7	1, 104	49	631
	1952	39	653	6	188	7	644	52	598
	1953	43	557	5	257	10	566	58	533

Figure 2. Average duration of stay of tuberculosis patients discharged from Broadlawns sanatorium, 1946-53, by stage of disease on admission.

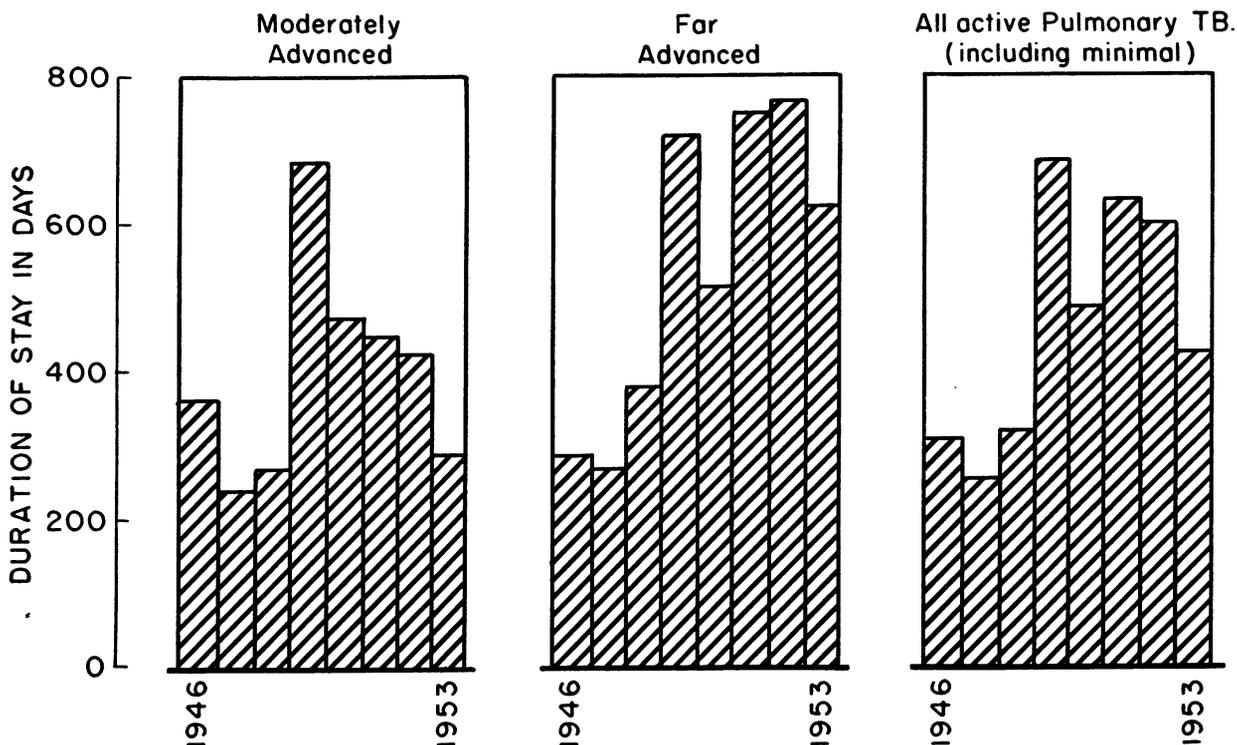
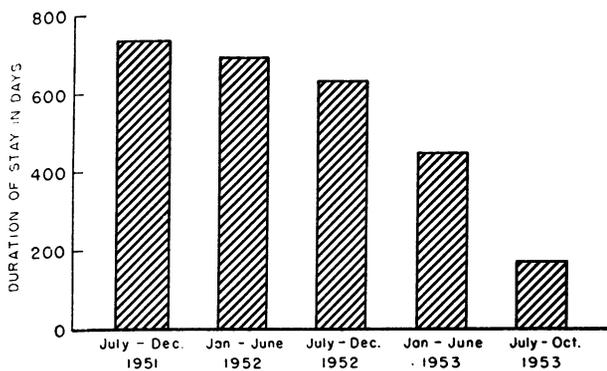


Figure 3. Average duration of stay in days for tuberculosis patients discharged to home care from Broadlawns sanatorium, 1951-53.



is the average duration of cases discharged to home care by 6-month periods since July 1951.

<i>Period</i>	<i>Number of cases</i>	<i>Average duration in days</i>
January-June 1951-----	2	-----
July-December 1951-----	12	733
January-June 1952-----	15	691
July-December 1952-----	12	632
January-June 1953-----	11	447
July-October 1953-----	14	170

It will be noted that declines are continuous and that those discharged in the last 4 months of 1953 had been in the hospital only about one-fourth as long as those discharged in the last half of 1951.

Summary

Recent years seem to have brought about an increase in the proportion of discharges "with advice" and a decrease in discharges as "dead" and "against advice." In 1953 over 70 percent of the discharges were "with advice" as compared to somewhat over 40 percent in 1946. This trend is much more pronounced in far advanced tuberculosis. Evidently the outlook is

much more favorable now than formerly. This favorable outlook for tuberculosis patients admitted to Broadlawns Polk County Hospital, Des Moines, Iowa, has been accomplished at the expense of longer single hospitalization per patient, with large increases occurring about 1949. This longer hospitalization seems to be true both of those discharged with advice and those who died. The average duration of single hospital stay seems to have reached its peak in 1949 and may be declining for all tuberculosis as it appears to be for moderately advanced tuberculosis. No data are available regarding the total hospitalization throughout the tuberculous person's life.

Since 1951 a large proportion of patients discharged with advice have been placed on "home care." Persons with active tuberculosis in Des Moines are handled as are cases of other communicable disease and are closely supervised either in or out of the sanatorium. The duration of hospitalization of such home care cases has declined precipitously. The average stay of those discharged in the period July-October 1953 was less than one-quarter of that in 1951. This trend appears to be affecting the average duration of moderately advanced tuberculosis, which is now approximately half of what it was in the years 1949 and 1950 and as low as in the years 1946 and 1947.

In studying duration of single hospitalizations it is important to distinguish between what has happened since 1949 and what has happened since 1946. At Broadlawns, the recent declines for moderately advanced tuberculosis in duration of hospital stay—about half that of 1949, 1950, and 1951—have brought the average stay down to the level of 1946 and 1947.

The real gain in the hospitalization of tuberculosis patients has been the change from discharged "against advice" to discharged "with advice" and a decline in the case fatality rate.